

CH 679296 A5

(19)



SCHWEIZERISCHE EIDGENOSSENSCHAFT  
BUNDESAMT FÜR GEISTIGES EIGENTUM

(11) CH 679296 A5

(51) Int. Cl.<sup>5</sup>: B 61 B 1/02  
B 61 D 3/18

# Erfindungspatent für die Schweiz und Liechtenstein

Schweizerisch-liechtensteinischer Patentschutzvertrag vom 22. Dezember 1978

## (12) PATENTSCHRIFT A5

(21) Gesuchsnummer: 2832/88

(73) Inhaber:  
Inventio AG, Hergiswil NW

(22) Anmeldungsdatum: 25.07.1988

(24) Patent erteilt: 31.01.1992

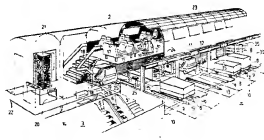
(45) Patentschrift  
veröffentlicht: 31.01.1992

(72) Erfinder:  
Anderegg, Kurt, Rheineck

### (54) Transporteinrichtung für den Personen- und Fahrzeugverkehr.

(57) Mit dieser Transporteinrichtung wird gleichzeitig Personen- und Fahrzeugverkehr bewältigt. Reisende ohne Fahrzeuge erreichen einen ersten Steig (3) über Treppen (5), Rolltreppen (6) und/oder über Steig (3)-niveaugleiche Zugänge. Fahrgesteuerte Fahrzeuge (7) und/oder fahrerlose Fahrzeuge (8) erreichen einen zweiten Steig (4) auf nicht dargestellten Wegen. Den fahrgesteuerten Fahrzeugen (7) werden bei der Platzreservation von einem Verkehrsrechner Wartepplätze (9) zugeteilt. Die fahrerlosen Fahrzeuge (8) erhalten ihre Wartepplätze (9) über vom Verkehrsrechner angesteuerte Leitkabel (10) zugeteilt. Sobald die Fahrzeuge (7, 8) des ankommenden Zuges einen Eisenbahnwagen (2) über die hintere Seite verlassen haben, erhalten die sich auf den Wartepplätzen (9) befindlichen Fahrzeuge (7, 8) über Weiterfahrtsmelder (12) oder über das Leitkabel (10) freie Vorfahrt. Der Eisenbahnwagen (2) besteht aus einem den Personenverkehr aufnehmenden Zwischendeck (14) und Oberdeck (15) sowie aus einem den Fahrzeugverkehr aufnehmenden Unterdeck (16), das quer zur Längsrichtung des Eisenbahnwagens (2) liegende Verladeplätze (33) aufweist. Jeder Verladeplatz (33) ist mit von einer Solartankstelle (22) versorgten Zapfstellen (24, 25) für die elektromotorisch angetriebenen fahrgesteuerten und fahrerlosen Fahrzeuge (7, 8) versehen. Die Solartankstelle (22) besteht im wesentlichen aus einem sich über das Dach des Eisenbahnwagens (2) erstrecken-

den Solarzellenfeld (23) und einer vom Solarzellenfeld (23) gespeisten Batterie sowie Regeleinrichtungen und einer Hilfsspeisung.



## Beschreibung

Die Erfindung betrifft eine Transporteinrichtung bestehend aus einem Bahnsteig mit einem ersten Steig zur Bewältigung des durch Reisende verursachten Personenverkehrs und einem zweiten Steig zur Bewältigung des durch schienenlose Fahrzeuge verursachten Fahrzeugverkehrs sowie aus mehrstöckigen, Solartankstellen aufweisenden Eisenbahnwagen zur Aufnahme des Personenverkehrs im Oberdeck und zur Aufnahme des Fahrzeugverkehrs im Unterdeck.

Aus der Patentschrift CH 435 359 ist eine Einrichtung zum Transportieren von Reisenden und Personenwagen auf dem Schienenweg bekannt, bei der Personenwagen quer zur Fahrtrichtung des aus einstöckigen Eisenbahnwagen bestehenden Eisenbahnzuges verladen werden. Die Personenwagen gelangen selbständig über Gebührenplätze ebenerdig auf die Eisenbahnwagen. Jeder zweite Verladeplatz wird von der einen Zugsseite, die übrigen Verladeplätze werden von der anderen Zugsseite angefahren, so dass gleichzeitig auf beiden Seiten des Zuges ein Verlad und ein Entlad von Personenwagen erfolgt. Für die Inassens der Personenwagen ist am vorderen Ende eines jeden Eisenbahnwagens ein kleines Passagierabteil vorgesehen.

Die Nachteile dieser bekannten Einrichtung liegen darin, dass die Eisenbahnwagen wegen ihrer übermässig breiten Spur nicht auf dem üblichen Schienennetz eingesetzt werden können, dass die Eisenbahnwagen den heutigen Anforderungen an den umweltgerechten Verkehr nicht mehr genügen, dass nur für die Inassens der Personenwagen im Passagierabteil Platz vorgesehen ist und dass durch den Verlad und Entlad von Personenwagen auf beiden Seiten des Zuges ein Mehraufwand an Anzeige- und Steuereinrichtungen entsteht.

Hier will die Erfindung Abhilfe schaffen. Die Erfindung, wie sie in den Ansprüchen gekennzeichnet ist, löst die Aufgabe, eine Transporteinrichtung zu schaffen, die sich gleichzeitig für den üblichen Transport von Reisenden und für den Verlad von schienenlosen Fahrzeugen eignet.

Die durch die Erfindung erzielten Vorteile sind im wesentlichen darin zu sehen, dass durch die erfindungsgemässe Transporteinrichtung ohne Veränderung des bestehenden Schienennetzes ein verbessertes Angebot an Dienstleistungen im Bereich Transportwesen ermöglicht wird. Zudem erfolgt ohne Mehraufwand an Personal eine höhere Ausnützung der Eisenbahneinrichtungen.

Im folgenden wird die Erfindung anhand von lediglich einen Ausführungsweg darstellenden Zeichnungen näher erläutert. Es zeigen:

Fig. 1 eine Perspektivansicht eines Bahnsteiges und eines Eisenbahnwagens für Reisende und schienenlose Fahrzeuge,

Fig. 2 eine Aussenansicht des erfindungsgemässen Eisenbahnwagens gemäss Fig. 1,

Fig. 3 eine schematische Querschnittsansicht des Eisenbahnwagens gemäss Fig. 1,

Fig. 4 einen waagrechten Längsschnitt eines Oberdecks des Eisenbahnwagens gemäss Fig. 1,

Fig. 5 einen waagrechten Längsschnitt eines Zwischen- und Unterdecks des Eisenbahnwagens gemäss Fig. 1,

Fig. 6 eine schematische Darstellung eines fahrerlosen Fahrzeuges und

Fig. 7 ein Blockschaltbild einer Solartankstelle des Eisenbahnwagens gemäss Fig. 1.

In den Fig. 1 bis 7 ist mit 1 ein Bahnsteig und mit 2 ein Eisenbahnwagen bezeichnet. Der Bahnsteig 1 weist einen Steig 3 für den Personenverkehr und einen zweiten Steig 4 für den Fahrzeugverkehr auf. Reisende ohne Fahrzeuge erreichen den ersten Steig 3 über vom zweiten Steig 4 getrennte Treppen 5 oder über Rolltreppen 6 oder aber über nicht dargestellte Steig 3-niveaugleiche Zugänge. Fahrgesteuerte Fahrzeuge 7 und/oder fahrerlose Fahrzeuge 8 erreichen den zweiten Steig 4 über nicht dargestellte auf Verladeniveau führende Wege. Den fahrgesteuerten Fahrzeugen 7 werden von einem nicht dargestellten Verkehrsrechner bei der Platzreservation Wartepätze 9 zugeteilt. Die fahrerlosen Fahrzeuge 8 erhalten ihre Wartepätze 9 über in die Fahrbahn eingelassene, vom Verkehrsrechner angesteuerte Leitkabel 10 zugeteilt, welche zu jedem Wartepatz 9 des zweiten Steiges 4 führen. Über jedem Wartepatz 9 ist eine aus einem Destinationsmelder 11 und einem Weiterfahrtsmelder 12 bestehende Anzeigevorrichtung angeordnet, die vom Verkehrsrechner gesteuert wird. Die fahrerlosen Fahrzeuge 8 erhalten ihre Weiterfahrtsbefehle über das Leitkabel 10. Nach der Zugsanfahrt werden die Fahrzeuge 7; 8 mit Hilfe von sich über alle Wartepätze 9 eines Eisenbahnwagens 2 erstreckenden Positioniereinrichtungen 13 auf die Position des Eisenbahnwagens 2 ausgerichtet. Sobald die Fahrzeuge 7; 8 den ankommenden Zuges den Eisenbahnwagen 2 über die hintere Seite verlassen haben, erhalten die sich auf den Wartepätzen 9 befindlichen Fahrzeuge 7; 8 freie Vorfahrt.

Im vorliegenden Ausführungsweg sind Fahrzeuge 7; 8 mit batteriegespeisten Elektromotor-Antrieben und/oder mit batteriegespeisten Bordnetzen vorgesehen. Die erfindungsgemässe Einrichtung eignet sich ebenso für den Verlad von mit Gas oder Benzin gespeisten Explosionsmotor-Antrieben ausgerüsteten Fahrzeugen. Im weiteren sind im vorliegenden Ausführungsweg vierdrädrige Fahrzeuge vorgesehen. Die erfindungsgemässe Einrichtung eignet sich ebenso für dreirädrige oder für zweirädrige Fahrzeuge, wie beispielsweise Motorräder, Motorfahrräder und Fahrräder.

Der Eisenbahnwagen 2 besteht aus einem den Personenverkehr aufnehmenden Zwischendeck 14 und Oberdeck 15 sowie aus einem den Fahrzeugverkehr aufnehmenden Unterdeck 16. Das durch auf dem Zwischendeck 14 und dem Oberdeck 15 angeordnete Sitzplätze 17 gebildete Sitzplatzangebot entspricht demjenigen eines üblichen einstöckigen Eisenbahnwagens. Das Oberdeck 15 ist vom Zwischendeck 14 aus über Treppen 18 und vom Unterdeck 16 aus über Wendeltreppen 19 erreichbar. Das Zwischendeck 14 steht über Treppen 18 mit dem Unterdeck 16 in Verbindung. Am linken Ende des Eisenbahnwagens 2 sind auf dem Zwischendeck 14

sanitäre Einrichtungen 20, eine Fernsprechkabine 21 und eine Solartankstelle 22 mit einem auf dem Dach des Eisenbahnwagens 2 angeordneten Solarzellenfeld 23 und auf dem Unterdeck 16 angeordneten Zapfstellen 24; 25 untergebracht. Das Unterdeck 16 weist quer zur Längsrichtung des Eisenbahnwagens 2 liegende Verladeplätze 33 auf, die einseitig und ausgangseitig durch Tore 34 verschliessbar sind. Die Leitkabel 10 des zweiten Steiges 4 werden auf den Verladeplätzen 33 in gleicher Richtung fortgesetzt. Sobald der einfahrende Zug steht erhalten die Leitkabel 10 die Verladeplätze 33 die gleichen Steuerbefehle wie diejenigen des zweiten Steiges 4. Jeder Verladeplatz 33 ist mit einer Zapfstelle 24 für fahrgesteuerte Fahrzeuge 7 und mit einer Zapfstelle 25 für fahrerlose Fahrzeuge 8 versehen. An den Zapfstellen 24 kann elektrische Energie für einen wählbaren Betrag gezapft werden. Der Betrag ist entweder mit Bargeld oder bargeldlos an einer Kassierstation zu entrichten. Die fahrerlosen Fahrzeuge 8 zapfen ihre Energie über an den Zapfstellen 25 angeordnete Stromschienen.

In einer weiteren Ausführungsvariante können die Wartplätze 9 und die Verladeplätze 33 längs zur Längsrichtung des Eisenbahnwagens 2 angeordnet werden.

Gemäss Fig. 7 versorgt eine mit 26 bezeichnete Batterie die Zapfstellen 24; 25. Ein Entladeregler 27 verhindert ein Entladen der Batterie 26 unter einen bestimmten Spannungswert durch die zapfenden Fahrzeuge 7; 8. Die von dem sich über das ganze Eisenbahnwagendach erstreckende Solarzellenfeld 23 erzeugte Energie gelangt über einen Laderegler 28 in die Batterie 26, die, falls mehr Energie erzeugt als verbraucht wird, den Energieüberschuss speichert. Der dem Solarzellenfeld 23 nachgeschaltete Laderegler 28 verhindert, dass die Batteriespannung über einen zulässigen Wert ansteigt. Die Pfeile im Blockschaltbild der Fig. 7 zeigen die Richtungen der Energieflüsse. Bei länger anhaltendem Energiedefizit gleicht ein von einer Fahrléitung 29 über Stromabnehmer 30 gespeistes, mit einem Transformator 31 und einem Gleichrichter 32 symbolisiertes Netzgerät die Energiebilanz aus.

In Fig. 6 ist ein fahrerloses, einen Gütercontainer 35 tragendes Fahrzeug 8 schematisch dargestellt. Der Antrieb des Fahrzeuges 8 erfolgt vorwärts und rückwärts über einen Elektromotor 36, der von einer Batterie 37 über die Leistungselektronik einer Steuerung 38 gespeist wird. Die Steuerung 38 steht in elektromagnetischer Verbindung mit dem in die Fahrbahn 3 eingelassenen Leitkabel 10. Aufgrund der vom Verkehrsrechner erteilten Steuerbefehle bestimmt die Steuerung 38 über den Elektromotor 36 die Geschwindigkeit und über eine Lenkeinheit 40 die Richtung des Fahrzeuges 8. Auf dem Verladeplatz 33 des Eisenbahnwagens 2 wird der Batterie 37 über in Kontakt mit den Stromschienen der Zapfstellen 25 stehende Stromabnehmer 41 Energie zugeführt und die Batteriespannung von einem Laderegler 42 geregelt. Ein mit Sicherheitskontakten versehener Auffahrsschutz 43 vermeidet Auffahrkollisionen.

## Patentansprüche

1. Transporteinrichtung bestehend aus einem Bahnsteig (1) mit einem ersten Steig (3) zur Bewältigung des durch Reisende verursachten Personenverkehrs und einem zweiten Steig (4) zur Bewältigung des durch schienenlose Fahrzeuge (7; 8) verursachten Fahrzeugverkehrs sowie aus mehrstöckigen, Solartankstellen (22) aufweisenden Eisenbahnwagen (2) zur Aufnahme des Personenverkehrs im Oberdeck (15) und zur Aufnahme des Fahrzeugverkehrs im Unterdeck (18), wobei Oberdeck und Unterdeck durch ein Zwischendeck (14) verbunden sind, dadurch gekennzeichnet, dass der zweite Steig (4) mit Positioniereinrichtungen (13) versehene Wartplätze (9) aufweist und im Unterdeck (16) der Eisenbahnwagen (2) Verladeplätze (33) vorgesehen sind, zu denen entlang von Leitkabeln (10) fahrerlose den Güterverkehr bewältigende Fahrzeuge (8) geführt werden.

2. Transporteinrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Verladeplätze (33) mit Stromschienen versehene Zapfstellen (25) für fahrerlose Fahrzeuge (8) zur selbsttätigen Zapfung von elektrischer Energie aufweisen.

3. Transporteinrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die fahrerlosen Fahrzeuge (8) Gütercontainer (35) tragen und zur Zapfung von elektrischer Energie Stromabnehmer (41) aufweisen.

4. Transporteinrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Verladeplätze (33) Zapfstellen (24) für fahrgesteuerte Fahrzeuge (7) mit zur Zapfung von elektrischer Energie für einen wählbaren Betrag vorgesehenen Kassierstationen für Bargeld und bargeldlose Zahlung aufweisen.

5. Transporteinrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Solartankstelle (22) ein zur Pufferung der Batterie (26) vorgesehenes fahrleitungsgespeistes Netzgerät aufweist.

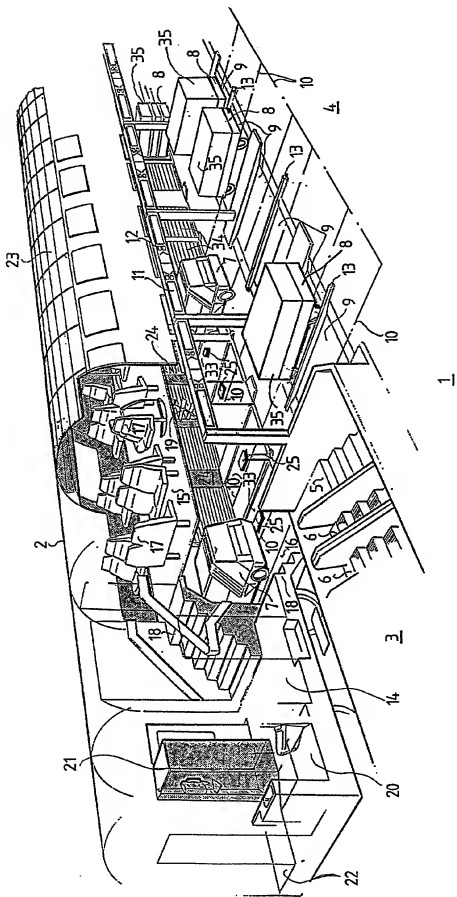
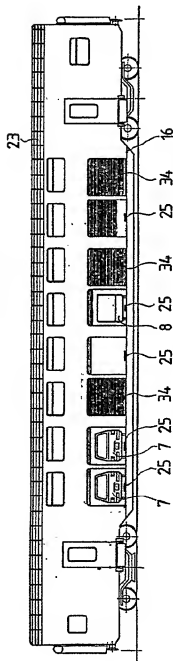
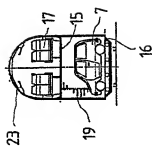
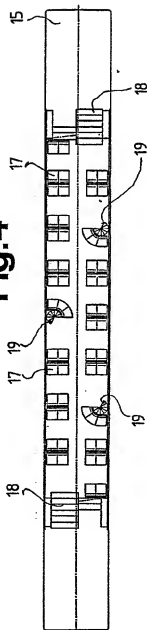
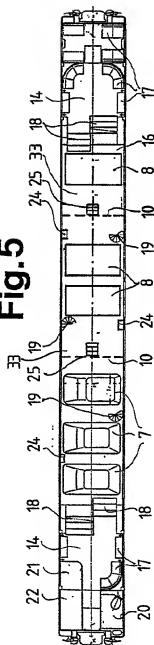
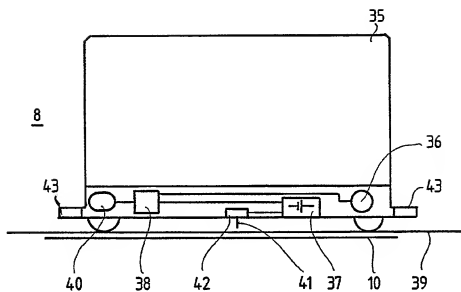
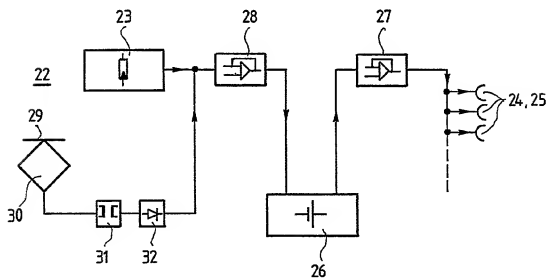


Fig. 1

**Fig.2****Fig.3****Fig.4****Fig.5**

**Fig.6****Fig.7**

(21) Application No: **0306330.0**

(22) Date of Filing: **10.04.2003**

(71) Applicant(s):  
**Advanced Transport Systems Limited**  
(Incorporated in the United Kingdom)  
Unit 5, Brunel Way, Thornbury, BRISTOL,  
BS35 3UR, United Kingdom

(72) Inventor(s):  
**Martin V Lowson**  
**Christopher V Cook**  
**David G H Hughes**

(74) Agent and/or Address for Service:  
**Hastell Lake & Co**  
Redcliff Quay, 120 Redcliff Street,  
BRISTOL, BS1 6HU, United Kingdom

(51) INT CL<sup>7</sup>:  
**B61B 1/02**

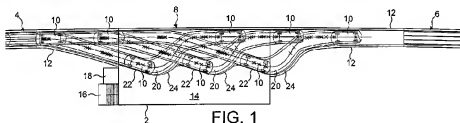
(52) UK CL (Edition W):  
**B7L LAC**

(56) Documents Cited:  
GB 1476783 A  
FR 002262619 A  
JP 100035486 A  
GB 1342987 A  
JP 580212529 A

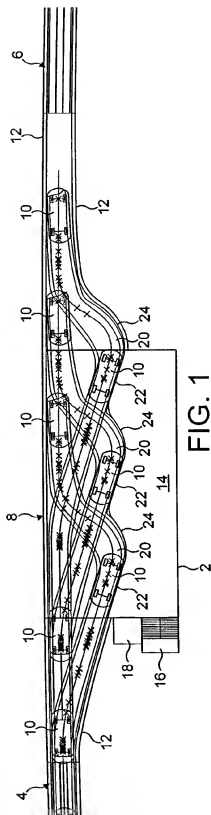
(58) Field of Search:  
UK CL (Edition V) B7L  
INT CL<sup>7</sup> B61B  
Other: ONLINE WPI EPODOC JAPIO

(54) Abstract Title: **Station design for personal rapid transport system**

(57) A station 2 in a personal rapid transit system has a platform 14, the edge of which defines bays 20 for parked vehicles 10 out of the path of travelling vehicles moving in a transit path extending between an entry section 4 and an exit section 6. The bays 10 include parking sections 22 at an oblique angle to the transit path, alongside which the vehicles may park to enable easy transfer of passengers into and out of the vehicles. The platform 14 has curved transition sections 24 between the parking sections 22. The stations can comprise platform tracks branched off the through track and disposed at a higher level and/or on either side of the through track.



**FIG. 1**





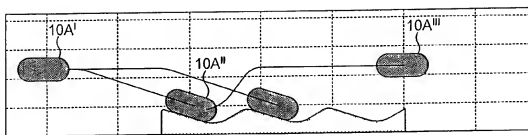


FIG. 2

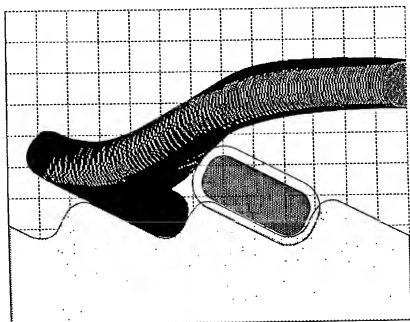
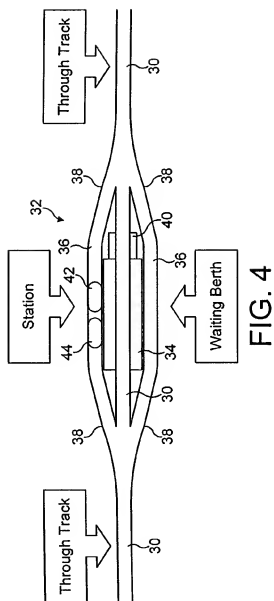


FIG. 3



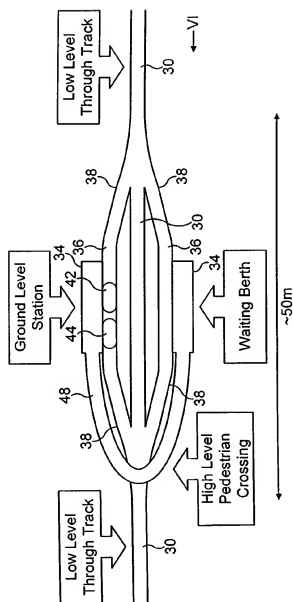
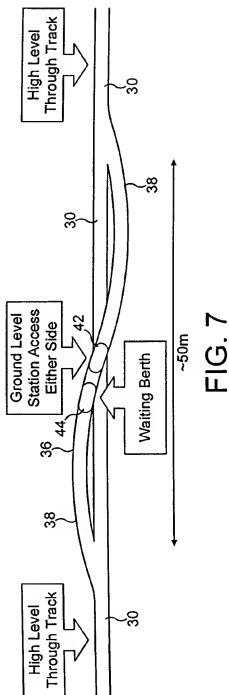
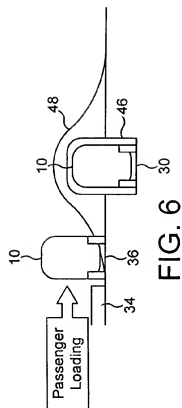


FIG. 5



STATION DESIGN FOR PERSONAL RAPID TRANSPORT SYSTEMS

This invention relates to the design of stations in a personal rapid transport system.

5 In general, a personal rapid transport (PRT) system comprises a dedicated guideway or track on which individual vehicles travel between stations. Each vehicle contains only one passenger or group of  
10 passengers, and the vehicle travels continuously between the starting point and the destination without stopping at any intermediate stations. PRT systems thus provide a compromise between a conventional mass transport system such as buses, trains and metro  
15 systems, and individual passenger cars.

An example of a PRT system is disclosed in US 4061089. In that system, a station is provided on a bypass guideway branched off the main guideway. Lateral bays  
20 or "slots" extend from the bypass guideway. Vehicles enter these slots to drop off or pick up passengers. While in the slots, the vehicles do not obstruct other traffic passing along the bypass guideway. However, manoeuvring the vehicles in to and out of the slots is  
25 not straightforward and requires mechanical handling of the vehicles. While this mechanical handling takes place, the vehicle may obstruct other vehicles travelling along the bypass guideway.

30 Another difficulty arising in stations is that steered vehicles require a significant distance in which to move close to a platform edge. Consequently, if a station is designed like a conventional railway station, with a single generally straight platform

edge, it will not be possible to park vehicles sufficiently close to the platform to achieve a sufficiently narrow gap (for example, of less than 50 mm) to avoid the danger of passengers injuring themselves as they move into or out of the vehicle. This is particularly so if other vehicles are already distributed along the platform.

According to the present invention there is provided a station in a personal rapid transit system, the station comprising a guideway portion bounded on at least one side by a platform, the width of the guideway portion being sufficient for travelling vehicles of the system to travel along a transit path unobstructed by vehicles parked against the platform, the platform extending generally parallel to the transit path, and comprising a plurality of bays for receiving parked vehicles, each bay being defined by a respective parking section of the platform edge, which parking section extends obliquely to the transit path, whereby a steered vehicle of the system can move from the transit path to park against the section of the platform edge of a respective one of the bays by turning from the transit path through an acute angle.

The parking section is preferably straight, and may be inclined to the transit path travel direction by an angle of less than 45 degrees. In a preferred embodiment, this angle is in the range of 10 to 30 degrees.

A vehicle entering the station is thus able to turn off the transit path through a relatively small angle and then continue along a substantially straight path to

park very close to the parking section, eliminating any substantial gap between the vehicle and the platform.

The bays may be distributed along the platform in a direction parallel to the transit path. The parking sections of adjacent bays may be joined to each other by a transition section which extends from the front end of the parking section of one bay to the rear end of the parking section of the adjacent bay. In this context, "front" and "rear" relate to the normal direction of travel of the vehicles. Thus, in operation, a vehicle entering the bay from the transit path will move parallel to the parking section towards the transition section, and stop with one side of the vehicle adjacent the platform at the parking section.

The transition section may be concavely curved with a radius of curvature greater than the turning circle of the vehicle, so that the vehicle may leave the bay without reversing so as to return to the transit path. Alternatively, the vehicle may perform a relatively short reversing manoeuvre before moving forwards to rejoin the transit path.

The length of the parking sections of the platform edge region is preferably approximately equal to, or perhaps slightly less than, the length of the vehicles of the PRT system.

In a preferred embodiment, the guideway portion, including the transit path, is straight, and the bays are distributed along the platform in a line generally parallel to the guideway portion. The parking sections of the bays are parallel to each other and the

perpendicular spacing between them is not less than one vehicle width.

It is desirable for several reasons for the main track of a PRT system to be elevated above ground level. This minimises obstruction to existing road traffic, but also reduces severance by the main track. That is, elevation of the main track does not provide a barrier to vehicles and pedestrians wishing to cross from one side of the track to the other. Elevating the main track avoids the needs for expensive bridges and underpasses.

It is not economically practical for vehicles to stop at stations while on the main track. This would obstruct the flow of other vehicles which may not need to stop at the same station. Consequently, it is known to divert vehicles off the main track on to a bypass track which passes through the station. Vehicles then leave the main track to pass along the bypass track for loading and unloading at the station. Where the main track is elevated, it is conventional for the bypass tracks passing through stations to be at the same level as the main track. This involves considerable capital expense, since the entire station structure needs also to be elevated. Furthermore, measures such as elevators and escalators need to be provided to transport passengers between ground level and the station.

According to a second aspect of the present invention, there is provided a station in a personal rapid transport system comprising a main track along which vehicles of the system travel between a departure



station and a destination station, the station being provided on a bypass track which is branched from the main track, the bypass track extending through the station at a level below that of the stretch of the  
5 main track which passes the station.

In one embodiment in accordance with this aspect of the present invention, the bypass track departs from, and rejoins, the main track on the same side of the main  
10 track, in which case the bypass track, as it extends through the station, is generally parallel to the main track. In an alternative embodiment, the bypass track leaves the main track on one side of the main track and rejoins on the other side. In this embodiment, the  
15 station and the bypass track extending through it, are situated beneath the main track.

A platform may be provided on one or both sides of the bypass track as it passes through the station.  
20

According to a third aspect of the present invention, there is provided a personal rapid transit system comprising a main track along which vehicles of the system travel between a departure station and a  
25 destination station, the station being provided on bypass tracks which are branched from the main track on opposite sides of the main track, the bypass tracks extending through the station.

30 A bridge may be provided over the main track, to connect platforms situated beside the bypass tracks. The platforms may, for example, be situated on the sides of the bypass tracks away from the main track.

For a better understanding of the present invention, and to show how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

5

Figure 1 shows a guideway portion of a personal rapid transport system;

Figure 2 indicates diagrammatically the travel paths of  
10 vehicles entering and leaving the guideway portion shown in Figure 1;

Figure 3 shows an alternative vehicle travel path;

15 Figure 4 shows a schematic station configuration.

Figure 5 shows an alternative schematic station configuration;

20 Figure 6 is a partial view taken generally in the direction of the arrow VI in Figure 5; and

Figure 7 shows a third schematic station configuration.

25 The guideway portion shown in Figure 1 passes through a station represented by a rectangular boundary 2. The guideway portion includes an entrance section 4 and an exit section 6, which comprise parallel-sided track ways. Between the sections 4 and 6 there is an  
30 intermediate section 8 which passes through the station 2. Vehicles 10 are represented in Figure 1, with moving vehicles shown in relatively faint outline, and stationary vehicles shown in relatively heavy outline. The vehicles have steered front wheels.

The sections 4 and 6 are single-track guideways bounded by walls 12. On one side of the guideway, the wall 12 continues along the intermediate portion 8, but on the other side the wall 12 terminates at the station 2. Within the station 2 there is a platform 14 which is accessible by passengers by means of stairs 16 and a lift 18.

10 The edge of the platform bounding the intermediate guideway 8 has a scalloped form defining a plurality of bays 20 (three in the embodiment shown in Figure 1). It will be appreciated that these bays are offset laterally from a notional transit path through the intermediate section 8 in alignment with the sections 4 and 6. Consequently, vehicles 10 parked in the bays 20 will not obstruct vehicles travelling along the transit path to or from one or other of the bays 20.

20 Each bay 20 is defined by a straight parking section 22 and a transition portion 24 of the edge of the platform 14. The parking sections 22 are parallel to each other and are inclined at an angle of approximately  $15^\circ$  to the direction of the transit path. Each parking section 22 has a length which is approximately equal to that of each vehicle 10, although it will be appreciated that the parking section 22 of the bay 20 nearest to the entry section 4 is extended in order to merge with that section. Thus, as shown in Figure 1, each bay 20 may be occupied by a single vehicle parked side on to the parking section 22, so that side doors of the vehicle open on to the platform 14. The transition section 24 of each bay 20 extends from the front end of the respective parking section 22 to the

rear end of the parking section of the next bay 20 to the front, with the exception of the transition portion of the bay 20 nearest to the exit section 6, which merges into that section.

5

The oblique orientation of the parking sections 22 means that vehicles 10, steered by their front wheels, can move off the transit path into a bay by a simple turn through  $15^\circ$ , ie the angle of inclination of the parking sections 22 relative to the transit path. The vehicle can then proceed into the bay, stopping with its side not more than 50 mm from the platform edge.

As shown in Figure 1, the transition sections 24 are concave, and curved with a radius somewhat larger than the radius of the minimum turning circle of the vehicles 10. As a result, a vehicle 10 parked in a bay 20 can leave the bay by moving forwards past the transition section 24 to rejoin the transit path. This manoeuvre is represented for the vehicle 10A in Figure 2, the travel path of which is shown for a manoeuvre from the transit path at position 10A' to a bay 20 in position 10A'' and then returning to the transit path at position 10A'''.

25

An alternative manoeuvre is shown in Figure 3, which is appropriate if the bays 20 need to be more closely stacked to increase the capacity of the station 2 without extending its length. In the manoeuvre shown in Figure 3, the vehicle 10A is reversed slightly from the parked position before moving forwards to rejoin the transit path, while avoiding a vehicle 10B parked in the adjacent bay 20.

It should be noted that, in Figures 2 and 3, the guideway portion is shown only diagrammatically, without boundary walls such as shown at 12 in Figure 1.

- 5 Figures 4 to 6 show different embodiments of a station which may or may not include the platform arrangement shown in Figures 1 to 3.

With reference to Figure 4, the PRT system comprises a  
10 main through track 30 which is elevated above ground level and runs past a station 32. At the station 32, there is a platform 34 disposed beneath the main track 30. Two branch bypass tracks 36 are branched from the main track 30 and extend past the platform 34 in a  
15 direction which is parallel to that of the track 30, with one on each side.

In use, passengers may reach the platform 34 from the ends, after passing underneath portions 38 of the  
20 bypass tracks shortly after they leave, or rejoin, the elevated main track 30. At these regions, the bypass track 36 is sloping downwards from the main track 30 towards the level of the platform 34, and consequently there is sufficient headroom for the passage of  
25 passengers. The portions 38 on the left of the station as seen in Figure 4 are used for deceleration of the vehicles 10 after they have left the main track 30. The portions of the bypass track 38 to the right as seen in Figure 4 are used for acceleration of the  
30 vehicles 10 before they rejoin the track 30. Consequently, vehicles travelling along the track 30 past the station may travel at the full normal speed, so minimising congestion on the main track 30.

There may be a lift 40 to provide access to the platform 34 to disabled people, or, in some circumstances, where the platform 34 is situated some level above ground level, but nevertheless beneath the main track 30.

The platform 34, and the bypass tracks 36, may be constructed in the manner disclosed in Figures 1 to 3. Alternatively, however, each bypass track may comprise a loading bay 42 and one or more waiting bays 44. In use, passengers embark and disembark from vehicles in the loading bay 42. Any empty vehicles waiting for new passengers will stand in the waiting bay 44. Vehicles entering the station with passengers intending to disembark will be diverted to the bypass track having the shortest wait before reaching the loading bay 42, or alternatively may be permitted to disembark in a waiting bay 44.

The station configuration shown in Figures 5 and 6 also comprises a main track 30 and bypass tracks 36, having acceleration and deceleration portions 38. In the station configuration shown in Figures 5 and 6, the main track extends approximately at ground level (shown in Figure 6 in a shallow cutting 46). The bypass track 36 is also substantially at ground level. The platforms 34 of the station shown in Figure 5 are disposed on the side of the bypass tracks 36 away from the main track 30. Consequently, passengers arriving at the station to transfer to a vehicle 30 can approach from either side without needing to cross either the main track 30 or the bypass tracks 36. However, a bridge 48 may be provided extending between the platforms 34 and passing over the main track 30 at a

position before (or after) that at which the bypass tracks 36 branch off (or rejoin) the main track 30.

Figure 7 shows a station configuration which is a  
5 modification of that shown in Figure 4 and, again, similar reference numbers are used to designate similar features.

10 In the configuration of Figure 7, the bypass track 36 leaves the main track 30 on one side, then passes beneath the main track 30 to rejoin on the other side. Thus, the station itself is situated directly beneath the main track 30 and, again, passengers may move from one side to the other of both the main track 30 and the  
15 bypass track 36 by passing beneath the deceleration and acceleration portions 38.

**CLAIMS**

1. A station in a personal rapid transit system, the station comprising a guideway portion bounded on at least one side by a platform, the width of the guideway portion being sufficient for travelling vehicles of the system to travel along a transit path unobstructed by vehicles parked against the platform, the platform extending generally parallel to the transit path, and comprising a plurality of bays for receiving parked vehicles, each bay being defined by a respective parking section of the platform edge, which parking section extends obliquely to the transit path, whereby a steered vehicle of the system can move from the transit path to park against the section of the platform edge of a respective one of the bays by turning from the transit path through an acute angle.
2. A station as claimed in claim 1, in which the transit path and the bays are provided on a common continuous surface of the guideway portion.
3. A station as claimed in claim 1 or 2, in which the guideway portion of the station comprises a bypass branched from a main guideway of the system.
4. A station as claimed in any one of the preceding claims, in which the parking section of each bay is inclined at an angle of less than 45 degrees to the transit path.
5. A station as claimed in claim 4, in which the angle of inclination of each parking section is not less than 10 degrees and not more than 30 degrees.



6. A station as claimed in any one of the preceding claims, in which the parking sections of adjacent bays are connected to each other by a transition section which extends from the front end of one of the parking sections to the rear end of the other.

7. A station as claimed in claim 6, in which each transition section is concavely curved with a radius of curvature greater than the radius of the minimum turning circle of vehicles of the system.

8. A station as claimed in any one of the preceding claims, in which the parking section of each bay has a length which is able to accommodate no more than one vehicle of the system.

9. A station as claimed in any one of the preceding claims, in which the parking sections extend substantially parallel to each other.

10. A station as claimed in claim 9, in which the spacing between adjacent parking sections is not less than the width of vehicles of the system.

11. A station in a personal rapid transit system comprising a main track along which vehicles of the system travel between a departure station and a designation station, the station being provided on a bypass track which is branched from the main track, the bypass track extending through the station at a level below that of the stretch of the main track which passes through the station.

12. A station as claimed in claim 11, in which the bypass track leaves the main track to one side of the main track and joins the main track on the other side.
- 5 13. A station as claimed in claim 12, in which the station is situated beneath the main track.
14. A station as claimed in any one of claims 11 to 13, in which a platform is situated adjacent the bypass  
10 track on both sides of the bypass track.
15. A station as claimed in claim 11, in which the bypass track is branched from and rejoins the main track on the same side of the main track.
- 15 16. A station as claimed in claim 15, in which two bypass tracks are provided, one on each side of the main track.
- 20 17. A station as claimed in claim 16, in which a platform is situated between the branch tracks.
18. A station in a personal rapid transit system comprising a main track along which vehicles of the  
25 system travel between a departure station and a destination station, two bypass tracks being branched from the main track on opposite sides of the main track, the bypass tracks extending through the station.
- 30 19. A station as claimed in claim 18, in which a bridge extends over the main track to connect platforms disposed beside the bypass tracks.

20. A station as claimed in claim 19, in which the platforms are disposed on the sides of the bypass tracks situated away from the main track.
- 5 21. A station as claimed in any one of claims 15 to 20, in which the main track runs past the station in a cutting.
- 10 22. A station substantially as described herein with reference to, and as shown in, Figures 1 to 3, or Figure 4, or Figures 5 and 6, or Figure 7 of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0308330.0  
Claims searched: 1-10

Examiner: Roger Binding  
Date of search: 29 May 2003

## Patents Act 1977 : Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-6, 8-10	JP 580212529 A (KAWASAKI HEAVY INDUSTRIES), see the abstract and especially Fig.3(b).

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>Y</sup>:

B7L

Worldwide search of patent documents classified in the following areas of the IPC<sup>Y</sup>:

B61B

The following online and other databases have been used in the preparation of this search report:

Online WPI EPODOC JAPIO



Application No: GB 0308330.0  
Claims searched: 18-21

Examiner: Roger Binding  
Date of search: 14 August 2003

## Patents Act 1977 : Further Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	18, 19	GB 1476783 A (BOURASSA), see especially Figs 1 & 3.
X	18, 19	GB 1342987 A (ALDEN SELF TRANSIT)
X	18, 21	FR 2262619 A (ARTHAUD), see abstract and Figs 2 to 4.
X	18	JP 10035486 A (YOSHIKAWA), see abstracts and drawings.

### Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category	P Document published on or after the declared priority date but before the filing date of this invention
& Member of the same parent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>6</sup>:

B7L

Worldwide search of patent documents classified in the following areas of the IPC<sup>7</sup>:

B61B

The following online and other databases have been used in the preparation of this search report :

Online WPI EPODOC JAPIO



INVESTOR IN PEOPLE

**Application No:** GB 0308330.0  
**Claims searched:** 18-21

**Examiner:** Roger Binding  
**Date of search:** 14 August 2003

## Patents Act 1977 : Further Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	18, 19	GB 1476783 A	(BOURASSA), see especially Figs 1 & 3.
X	18, 19	GB 1342987 A	(ALDEN SELF TRANSIT)
X	18, 21	FR 2262619 A	(ARTHAUD), see abstract and Figs 2 to 4.
X	18	JP 10035486 A	(YOSHIKAWA), see abstracts and drawings.

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>V</sup>:

B7L

Worldwide search of patent documents classified in the following areas of the IPC<sup>7</sup>:

B61B

The following online and other databases have been used in the preparation of this search report :

Online WPI EPODOC JAPIO

# (12) **UK Patent Application** (19) **GB** (11) **2 384 223** (13) **A**

(43) Date of A Publication **23.07.2003**

(21) Application No **0301027.9**

(22) Date of Filing **16.01.2003**

(30) Priority Data  
(31) **0201097** (32) **17.01.2002** (33) **GB**

(71) Applicant(s)  
**Advanced Transport Systems Limited**  
(Incorporated in the United Kingdom)  
Bridge House, Sion Place, Clifton,  
BRISTOL, BS8 4AP, United Kingdom

(72) Inventor(s)  
**Martin V Lowson**  
**Christopher V Cook**  
**Anthony D Kerr**

(74) Agent and/or Address for Service  
**Haseltine Lake & Co**  
Imperial House, 15-19 Kingsway,  
LONDON, WC2B 6UD, United Kingdom

(51) INT CL<sup>7</sup>  
**E01B 25/00, B61B 13/00**

(52) UK CL (Edition V)  
**B7L LT**

(56) Documents Cited  
**GB1210419 A** **EP 0010733 A**  
**JP 040062203 A** **US 5287811 A**

(58) Field of Search  
**UK CL (Edition V) B7L**  
**INT CL<sup>7</sup> B61B, E01B**  
Other: **ONLINE WPI EPODOC JAPIO**

(54) Abstract Title  
**Trackway for personal rapid transport systems**

(57) The trackway comprises longitudinally adjacent trackway sections 1, each comprising a pair of parallel hollow steel side beams 4, 6 interconnected by spaced hollow steel cross members 2. The cross members 2 support a pair of reinforced concrete track members 10, 12 which provide running surfaces of the trackway. The trackway can be at ground level, or elevated using longitudinally spaced hollow columns 24, each supporting ends of adjacent sections via a support plate 22 and resilient elements 26, 28.

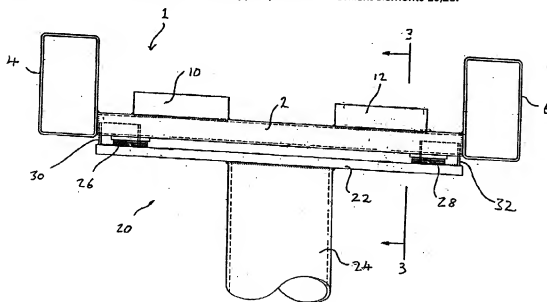
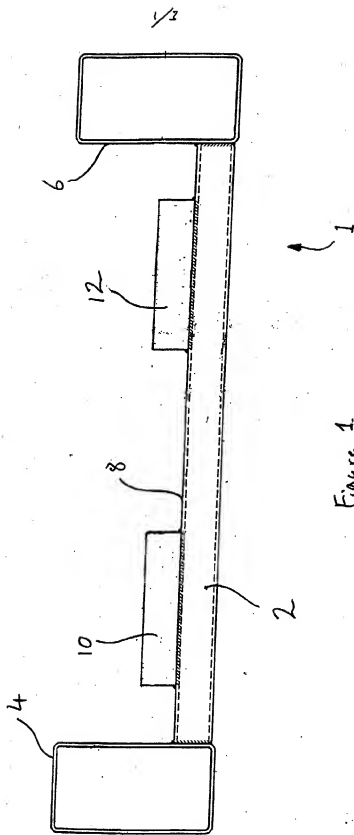


Figure 2

**GB 2 384 223 A**





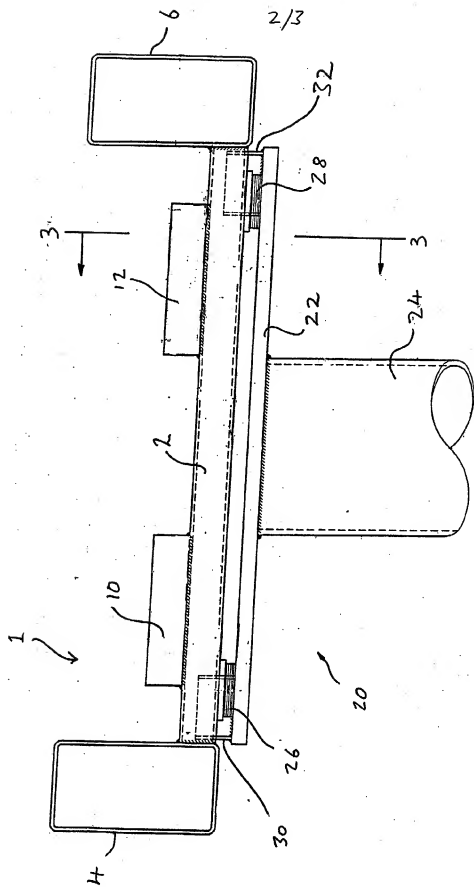


Figure 2

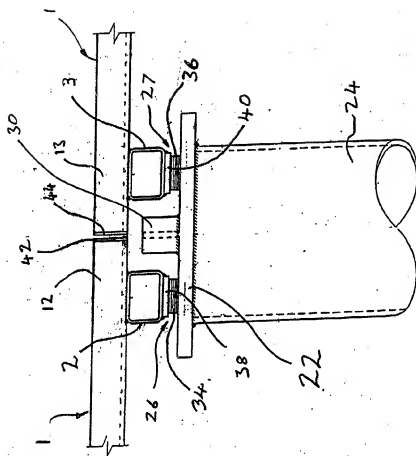


Figure 3

TRACKWAY FOR PERSONAL RAPID TRANSPORT SYSTEMS

This invention relates to the design of a trackway in a personal rapid transport system.

5 In general, a personal rapid transport (PRT) system comprises a dedicated trackway on which individual vehicles travel between stations. Each vehicle contains only one passenger or group of passengers, and  
10 the vehicle travels continuously between the starting point and the destination without stopping at any intermediate stations. PRT systems thus provide a compromise between a conventional mass transport system such as buses, trains and metro systems, and individual  
15 passenger cars.

Typical PRT systems use a rail system to provide guidance for the vehicles. This may be a monorail or dual rail, and points similar to standard railway  
20 points are used to direct the vehicles at junctions. An example of such a system is disclosed in US 5,778,796.

An example of an alternative PRT system is disclosed in US 4,061,089. In this system each vehicle is supported  
25 by air bearings in such a way that an air gap is maintained between the vehicle and the trackway. Vehicle propulsion is provided by a linear synchronous motor, the primary circuit of which is embedded in the trackway to activate a pair of linear induction motors  
30 located on the vehicle.

In both of the above systems, the cost of constructing the trackway is a substantial barrier to implementing the system. Also, to be acceptable, the trackway of a

PRT system must require little urban space and must have minimal visual intrusion.

According to the present invention there is provided a  
5 trackway for a personal rapid transport system, the  
trackway comprising a plurality of longitudinally  
adjoining trackway sections, each section comprising a  
pair of parallel side beams interconnected by spaced  
cross-members which support a pair of elongate track  
10 members extending parallel to the side beams, the track  
members providing running surfaces of the trackway, the  
side beams and the cross members comprising hollow  
steel structural members and the track members  
comprising preformed reinforced concrete members.

15 In a preferred embodiment in accordance with the  
present invention the side beams of the trackway have  
generally rectangular cross sections. The cross members  
may also be generally rectangular in cross section, and  
20 may be connected to the side beams at the lower regions  
of the side beams, whereby the side beams form side  
walls which extend upwardly from the cross members.

Preferably the track members have flat upper surfaces  
25 acting as running surfaces on which the wheels/tyres of  
the vehicles of the PRT system run. The track members  
may have a generally rectangular cross section, and are  
preferably spaced inwardly from the side beams, for  
example by a distance of not less than 100mm.

30 The trackway may be situated at ground level or in a  
cutting. Alternatively, the trackway may be elevated,  
in which case the trackway sections may be supported by  
one or more supports, each comprising a column anchored

into the ground. Adjoining trackway sections preferably meet at the column.

It is desirable for several reasons for the trackway of a PRT system to be elevated above ground level where appropriate. This minimises obstruction to existing road traffic, but also reduces severance by the trackway member. That is, an elevated trackway does not provide a barrier to vehicles and pedestrians wishing to cross from one side of the trackway to the other. Elevating the trackway avoids the need for expensive bridges and/or underpasses.

Resilient supporting elements may be provided to support the trackway sections, and may be made from a material such as neoprene. Stop means may be provided, for limiting the lateral displacement of the trackway sections in relation to the support.

In a preferred embodiment, the side beams extend above the running surfaces, for example to a level not less than 200mm above the running surface. The total width of the trackway is preferably not more than 3 metres, and the width between side beams not more than 2 metres.

A trackway in accordance with the present invention can be constructed to be minimally visually intrusive, since the width and height can be relatively small in comparison with known trackways. Additionally, the structure is relatively simple and inexpensive to construct.

For a better understanding of the present invention and to show more clearly how it may be carried into effect, reference will now be made by way of example to the accompanying drawings, in which:-

5

Figure 1 is a partial cross section of a one-way trackway.

Figure 2 is a cross section view of the trackway of

10

Figure 1 mounted on a support.

Figure 3 is a cross section view taken from the line 3-3 of Figure 2.

15 The trackway shown in the Figures comprises a series of trackway sections 1 laid end-to-end as shown in Figure 3. Each section 1 comprises a plurality of spaced-apart parallel cross members, each comprising a hollow, thin walled rectangular cross section steel beam with

20 rounded corners, extending laterally across the width of the trackway (see also Figure 3). The cross members 2 extend between side beams 4, 6. The side beams 4, 6 are identical thin walled rectangular cross-section steel members which extend along the sides of the track

25 section 1. The vertically extending innermost side wall of each side beam 4, 6 is welded to the cross members 2 at the base of the side wall. Accordingly, the side beams each extend vertically above the cross members 2. In the embodiment shown, the vertical

30 dimensions of the cross members 2 and the side beams 4, 6 are 100 mm and 450 mm respectively.

First and second track members 10, 12 are secured to the upper surfaces 8 of the cross members 2, and spaced

upwardly from the side beams 4, 6. The track members 10,12 are secured either by edge clamping or retaining bolts (not shown). Alternatively, the undersurface of the track members 10,12 may be provided with a profile which is matched by the cross members 2 so as to restrain the track members 10,12 in position.

In the embodiment shown, the distance between each track member 10, 12 and the adjacent side beam 4, 6 is 160 mm. The track members 10, 12 are of rectangular cross-section having dimensions, in the embodiment shown, of 430 x 100 mm. The upper surfaces of the track member 10, 12 are flat and provide first and second running surfaces 3, 5 respectively. The track members 10, 12 extend longitudinally along the trackway, parallel to the side beams 4, 6 and perpendicular to the cross members 2.

Referring now to Figure 2, the track section 1 is shown in position on a support shown generally at 20. The support 20 comprises a support plate 22 of similar transverse width to the cross members 2. The support plate 22 extends horizontally across, and is supported centrally on, a column 24. The column 24 is a thin walled cylinder and is welded at its top end to the lower face of the support plate 22. The lower end of the column 24 is supported by the ground in a suitable foundation.

The columns 24 are spaced apart along the trackway by the length of each trackway section 1 (for example, 30 metres), so that each column supports the adjoining ends of successive trackway sections 1, as shown in

Figure 3. The resulting trackway may be, for example, 8 metres above ground level.

The trackway sections 1 are supported on the support plates 22 by means of resilient elements 26, 28. These resilient elements 26, 28 are located on the upper surface of the support plate 22 close to the lateral edges of the support plate 22. As seen in Figure 3, two pairs of the support members 26, 27 are spaced longitudinally along the trackway from each other. Each support 26, 27 comprises a resilient portion, for example of neoprene, fixed to the upper surface of the support plate 22 at their lower end and provided with rigid plates 38, 40 at their upper end. The plates 38, 40 are attached to and support the respective endmost cross members 2 of the trackway sections 1.

Stops 30, 32 are provided on the upper surface of the support plate 22, and project between the endmost cross members 2 of the track sections. Each stop 30, 32 comprises a short I-beam section extending upwardly from the support plate 22. The stops are spaced a short distance from the respective side beams 4, 6.

As shown in Figure 3, track members 12 and 13 of adjacent track sections 1 terminate at end plates 43, 44. An expansion gap is provided between the end plates 42, 44. In this way a substantially continuous track member is provided, along which the wheels of the vehicles of the PRT system can travel.

The resilient supports 26, 27, 28 allow a small amount of relative movement between the track sections 1 and the support 20 to insulate the track sections from



earth tremors. The stops 30, 32 prevent excessive lateral movement of the track sections 1 on the support 20, by abutting the lower portions of the side walls of the side beams 4, 6. The stops 30, 32 are positioned  
5 so that they can each engage the side beams 4, 6 of two adjacent trackway sections 1.

In the embodiment shown, the overall width of the trackway is 2.2 metres, the width between the side  
10 beams 4, 6 being 1.7 metres. The side beams 4, 6 have a height which is less than 0.5 metre, with the result that the overhead section of trackway has very low visual intrusion.

CLAIMS

1. A trackway for a personal rapid transport system, the trackway comprising a plurality of longitudinally adjoining trackway sections, each section comprising a pair of parallel side beams interconnected by spaced cross-members which support a pair of elongate track members extending parallel to the side beams, the track members providing running surfaces of the trackway, the side beams and the cross members comprising hollow steel structural members, and the track members comprising preformed reinforced concrete members.
2. A trackway as claimed in claim 1 wherein the side beams are of generally rectangular cross section.
3. A trackway as claimed in claim 1 or 2 wherein the cross members are of generally rectangular cross section.
4. A trackway as claimed in any one of the preceding claims, wherein the track members have flat upper surfaces acting as running surfaces.
5. A trackway as claimed in any one of the preceding claims, wherein the track members have a generally rectangular cross section.
6. A trackway as claimed in any one of the preceding claims, wherein the cross members are connected to the side beams at the lower regions of the side beams, whereby the side beams form side walls which extend upwardly from the cross members.

7. A trackway as claimed in any one of the preceding claims, wherein the track members are spaced inwardly from the side beams.
- 5 8. A trackway as claimed in claim 7, wherein the track members are spaced from the adjacent side beams by a distance of not less than 100mm.
9. A trackway as claimed in any one of the preceding  
10 claims wherein at least one of the trackway sections is supported on a support plate.
10. A trackway as claimed in claim 9, wherein a resilient element is provided between the support plate  
15 and one of the cross members of the or each supported track section.
11. A trackway as claimed in claim 10, wherein stop means is provided for limiting lateral displacement of  
20 the trackway relative to the support plate.
12. A trackway as claimed in any one of claims 8 to 10 wherein the support plate is provided on a column to elevate the trackway.
- 25 13. A trackway as claimed in claim 12 wherein adjoining trackway sections meet at the column.
14. A trackway as claimed in any one of the preceding  
30 claims, wherein the side beams extend above the running surfaces.

15. A trackway as claimed in any one of the preceding claims, wherein the total width of the trackway is less than 3 metres.

5 16. A trackway as claimed in any one of the preceding claims wherein the width between side beams is less than 2 metres.

10 17. A trackway as claimed in any one of the preceding claims, wherein the overall height of the or each track section is not greater than 0.5 metre.

18. A trackway as described herein with reference to, and as shown in, the accompanying drawings.

15

19. A personal rapid transport system comprising a trackway as claimed in any one of the preceding claims.

20



INVESTOR IN PEOPLE

Application No: GB 0301027.9  
Claims searched: 1-19

Examiner: Roger Binding  
Date of search: 19 February 2003

## Patents Act 1977 : Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A		EP 0010733 A (PARAZADER), see especially Fig 5 and page 6, line 13 onwards.
A		GB 1210419 A (SOC. DE L'AEROTRAIN)
A		JP 040062203 A (HITACHI KASADO), see abstract and drawings.
A		US 5287811 A (RAILWAY TECH. RES. INST.), see especially Fig 7 and column 4, line 5 onwards.

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>v</sup>:

B7L

Worldwide search of patent documents classified in the following areas of the IPC<sup>v</sup>:

B61B; E01B

The following online and other databases have been used in the preparation of this search report:

Online WPI EPDOC JAPIO

特開平11-209926

(43) 公開日 平成11年(1999) 8月3日

(51) Int.Cl.<sup>6</sup>

識別記号

F I

E 0 1 F 1/00

E 0 1 F 1/00

審査請求 未請求 請求項の数 1 書面 (全 3 頁)

(21) 出願番号 特願平10-42772

(22) 出願日 平成10年(1998) 1月20日

(71) 出願人 000232911

日野車体工業株式会社

神奈川県横浜市鶴見区尻手1-1-25

(72) 発明者 田中 辰秀

神奈川県横浜市鶴見区尻手1丁目1番25号

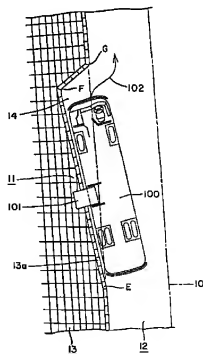
日野車体工業株式会社内

## (54) 【発明の名称】 バスのプラットフォーム

(57) 【要約】 (修正有)

【課題】 バスが簡単に縁石と平行で、かつ接近して停車することができるようにしたバスのプラットフォームを提供する。

【解決手段】 道路12よりも一段高くなった歩道13を切り欠いて作られるバスのプラットフォーム11であって、センターライン10に対して斜めに道路12から連続して略バス一台分の長さだけ歩道13を切り欠いてなる構成とした。すなわち、このプラットフォーム11は、道路12よりも一段高くなった歩道13の一部14(切り欠き14)を切り欠くようにして設けられており、その切り欠き14はE、F、G点とを結んだ略三角形をした切り欠き形状のようになっている。また、歩道13の端には、道路12と区別をするのに縁石13aが配設されている。



## 【特許請求の範囲】

【請求項1】 道路よりも一段高くなった歩道を切り欠いて作られるバスのプラットホームにおいて、センターラインに対して斜めに道路から連続して略バス一台分の長さだけ歩道を切り欠いてなることを特徴とするバスのプラットホーム。

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、バスを停車させる目的で、道路よりも一段高くなった歩道を切り欠いて作られるバスのプラットホームに関するものである。

【0002】

【従来の技術】図2は従来における歩道を切り欠いて作られたバスのプラットホームの一例を示すものである。図2において、このプラットホーム11は、道路12よりも一段高くなった歩道13の一部14（以下、「切り欠き14」と言う）を切り欠くようにして設けられており、その切り欠き14は図2中のA、B、C、D点とを結んだ略台形に形成されている。そして、バス100は、切り欠き14内に回り込むように進入してプラットホーム11に停車する。このため、点Bと点Cを結んだ箇所と平行に停車するのが難しく、図2に示すように縁石13aよりも離れた位置に停車されているのが現状である。

【0003】

【発明が解決しようとする課題】上述したように、従来のプラットホーム11を形成している切り欠き14の形状の場合では、バス100が縁石13aと平行に、かつ縁石13aに接近して停車するのが難しい。このため、場合によってはバスの乗降者は一度車道に降りる必要がある。しかも縁石13aとプラットホーム11との間には水が溜まっていたりする場合もあり、履き物を濡したりする不都合が生じることも少なくない。また、今日では、車椅子利用者のためにステップスロープ板101を引き出して使用できる構造のバスもあるが、縁石13aに近づいて停車していないと、ステップスロープ板101が縁石13aに届かないことがあったりして、使い勝手が悪い場合もある。

【0004】本発明は、上記問題点に鑑みてなされたものであり、その目的はバスが簡単に縁石と平行で、かつ接近して停車することができるようにしたバスのプラットホームを提供することにある。さらに、他の目的は、以下に説明する内容の中で順次明かしていく。

【0005】

【課題を解決するための手段】上記目的を達成するために本発明においては、道路よりも一段高くなった歩道を切り欠いて作られるバスのプラットホームにおいて、センターラインに対して斜めに道路から連続して略バス一台分の長さだけ歩道を切り欠いてなる構成としたものである。

【0006】これによれば、バスは道路から斜めに真っ直ぐ進入するだけで縁石と平行で、かつ接近して停車することができる。これにより、バスに乗り降りする際、車道に降りなくて済むとともに、ステップスロープ板も歩道上に正しく掛けて有効に活用することができる。

【0007】

【発明の実施の形態】以下、本発明の好適な実施形態を添付図面に基づいて詳細に説明する。なお、以下に述べる実施形態は、本発明の好適な具体例であるから技術的に好ましい種々の限定が付されているが、本発明の範囲は、以下の説明において特に本発明を限定する旨の記載がない限り、これらの実施形態に限られるものではないものである。

【0008】図1は本発明の一実施形態を示すものである。図1において図2と同一符号を付したものは図1と同一のものを示している。図1において、このプラットホーム11は、道路12よりも一段高くなった歩道13の一部14（切り欠き14）を切り欠くようにして設けられており、その切り欠き14は図1中のE、F、G点とを結んだ略三角形をした切り欠き形状のようになっている。また、歩道13の端には、道路12と区別をするために縁石13aが配設されている。

【0009】さらに詳述すると、切り欠き14を形成しているE点とF点を結んだ箇所は、センターライン10に対して斜めに道路12から連続して切り欠いてなる部分として作られており、その長さは少なくとも略バス一台分確保されている。一方、E点とF点を結んだ箇所は、鈍角で車道（道路12）に通じる部分として形成されている。なお、E点とF点を結んだ箇所の長さ及びセンターライン10に対する角度は、歩道13の幅や道路12の幅を考慮して設けられる。ここで重要な点は、バス100の停車時に、バス100の後部が切り欠き14より大きく道路12上にはみ出して停車し、道路12を走行する他の車両の妨げとならないようにすることである。

【0010】このように形成したプラットホーム11を使用した場合では、バス100は道路12からE点とF点を結ぶ縁石13aに沿って斜めに真っ直ぐ進入し、E点とF点を結ぶ縁石13aに沿って停車することができる。すなわち、縁石13aと平行で、かつ接近して停車することができる。これにより、バス100に乗り降りする際、道路12（切り欠き14の部分）に降りなくて済むとともに、ステップスロープ板101も歩道13の上に正しく掛け渡して有効に活用することができる。また、再び発車する場合は、図1中に矢印102で示す方向に動いて発車することができる。

【0011】

【発明の効果】本発明は、以上のように構成されているため、バスはセンターラインに対して斜めに真っ直ぐ進入し、縁石と平行で、かつ接近して停車することができる。

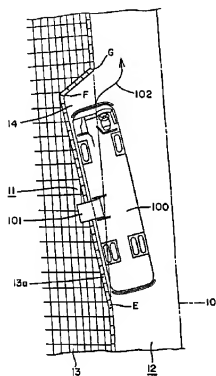
3

る。これにより、バスに乗り降りする際、乗降客は車道に降りなくて済むとともに、ステップスロープ板も歩道の上に正しく掛け渡して有効に活用することができる等の効果が期待できる。

【図面の簡単な説明】

【図1】本発明の一実施形態を示す図である。

【図1】



4

【図2】従来の一例を示す図である。

【符号の説明】

10…センターライン、11…プラットフォーム、12…道路、13…歩道、13a…縁石、14…切り欠き、100…バス。

【図2】

